Flammable Liquid Requirements

Flammable Liquid

Purpose
This document defines the minimum control measures required to reduce the risk of injury or illness related to the storage and use of flammable liquids.

Scope
Applicable to all Coca-Cola System locations (manufacturing, distribution, offices, laboratories and all others) worldwide that store or use liquids with a flash point less than 61°C (141°F) that sustain combustion.

Storage or use of #2 Diesel Fuel is specifically excluded from scope.

Definitions
See Appendix.

Requirements

1. Compliance
Implement management practices and controls in accordance with the stricter of Company requirements or applicable legal requirements\(^1\) related to flammable liquids.

- Establish and maintain processes to identify, access and periodically verify compliance with current versions of these applicable legal requirements. These processes may be specific to flammable liquids or part of a more comprehensive compliance process.

2. Hazard Identification and Risk Assessment
Conduct and document an initial assessment of facility activities and operational areas related to flammable liquids to identify and evaluate environmental and worker safety risks from the handling, storage, use and disposal of these materials.

\(^1\)“Applicable legal requirements” means any law, regulation, rule, requirement, standard, norm, decree or code applicable to the relevant facility and/or operation enacted, promulgated or issued by any governmental or regulatory agency or body at the National, Federal, State, Provincial, Municipal or other local level. It may also include relevant and applicable international or regional laws, regulations, rules and agreements, such as, but not limited to United Nations Guidelines and/or European Union (EU) Directives or Regulations, whether adopted into locally applicable law or directly applicable without the need for local adoption.
The assessment:

- May be either a stand-alone document or included as part of a more comprehensive risk assessment. Assessments conducted by third parties, including those for insurance placement, meet this requirement;
- Must be updated whenever processes, equipment or facilities related to the handling or storage of flammable liquids are added or modified; and
- Must be reviewed at least annually to verify that it is current.

3. Administrative Controls

3.1 Operating Controls
Develop site-specific operating procedures, work instructions and controls relative to the hazards identified in the assessment.

- Procedures, instructions and controls must address the relevant sections of this Requirement, and comply with the Managing Hazardous Materials, Hot Work and Fire Control Requirements.

3.2 Ignition Controls
Control ignition sources in areas where flammable liquids are stored, handled or dispensed. At a minimum:

- Store and use flammable liquids only in designated areas constructed and equipped with the appropriately classified wiring and equipment, as described below;
- Do not handle flammable liquids outside of closed systems in the presence of open flames or other ignition sources;
- Keep containers holding flammable liquids or wastes closed when not in use;
- Clean up spills of flammable liquids immediately, and control vapor evolution from spills to prevent flashback from an ignition source; and
- Maintain a 7.5 meters (25 feet) radius free of fire hazards (e.g., weeds, tall grass, litter, etc.) around flammable liquid storage areas.
- Any electrical equipment used in concentrate or beverage base plant flammable liquids processing rooms must be intrinsically safe, and designed and maintained to prevent electrostatic ignitions. This specifically includes cell phones, radios, pagers, and similar communication devices.

Areas designated as flammable liquid storage and use areas must be provided with the physical controls necessary to prevent ignition.

- Identify required control measures based on the site’s risk assessment.
Control measures must include those defined in Sections 4.1 through 4.9, as applicable. Additionally, TCCC operations must meet the requirements set forth in NFPA 30, ‘Flammable and Combustible Liquids Code.’

4. Physical Controls

4.1 Incidental Storage of Flammable Liquids
Small quantities of flammable liquids, nominally containers of 20 liters (5 gallons) or less, such as flavor samples, maintenance chemicals, coder inks/solvents, laboratory reagents or cleaning liquids, may be stored outside of designated flammable liquid storage and use areas under either of the following conditions:

- Quantities do not exceed the amount needed for daily use; OR
- The flammable liquids are stored in flammable liquids cabinets (as defined below), containers or ‘intrinsically safe’ refrigerators specifically designed for storage of flammable liquids:
  - The total volume of flammable liquids in a single cabinet must not exceed 227 liters (60 gallons).

4.2 Flammable Liquid Staging Areas
Flammable liquids may be temporarily stored in unprotected areas, such as docks, while staging materials for production or transfer to storage areas provided that:

- The total volume of the flammable liquids in containers, intermediate bulk containers and portable tanks is limited to:
  - Containers that are in use;
  - Containers that were filled in a single shift; and
  - Containers needed to supply one shift’s use.
- Liquids are not staged for more than 8 hours. Keep the containers closed and do not transfer liquid from the container while in an unprotected area.

4.3 Powered Equipment
All powered equipment, including fork lift trucks, powered hand trucks, pallet movers, hoists and floor cleaners must be classified as “EE,” “ES” or otherwise classified for use in areas where flammable vapor-air mixtures can exist under normal operations. Powered equipment without this rating is not permitted into any electrically classified area unless flammable vapors are confirmed through air monitoring to be at a concentration of less than 10% of the Lower Explosive Limit.
4.4 Electrical Systems
Appropriately classified electrical equipment, as defined by NFPA 30, ATEX, the National Electrical Code (NFPA 70) or local equivalent electrical code, is required where flammable liquids are transferred, dispensed, sampled or otherwise handled outside of permanent closed piping systems.

In the absence of other code, the following electrical classifications must be met:

- **NFPA Class I Division 1** – All areas within 1.5 meters (5 feet) extending in all directions; where flammable vapor-air mixtures can exist under normal operations. This includes processing areas, such as mixing and filling rooms, at bulk loading/unloading areas, and at tank openings and the vents of bulk storage tanks.

- **NFPA Class I Division 2** - Areas between 1.5 meters and 2.4 meters (5 feet and 8 feet) of any edge of such equipment, extending in all directions; also, area up to 1 meter (3 feet) above the floor or grade level within 1.5 meters and 7.6 meters (5 ft to 25 feet) horizontally from any edge of such equipment or any leak source where flammable vapor-air mixtures can exist under abnormal operations (e.g., spills).

- **Ordinary electrical classifications** are permitted in rooms outside of these specified distances and in storage areas containing < 1135 liters (300 gallons) of flammable liquids provided that:
  - All liquids are maintained in closed containers;
  - No liquids are transferred in the area;
  - The temperature in the area is maintained below the flash point of all stored flammable liquids; and
  - Dispensing is limited to a single container no larger than 19 liters (5 gallons).

4.5 Static Electricity Controls
Design and maintain all tanks, pipes and equipment used for storage and handling of flammable liquids to prevent electrostatic ignitions. Bond and ground all metallic equipment, including any electrically-isolated sections of metallic piping or equipment, where an ignitable mixture could be present to prevent the accumulation of static electricity.

- Ground truck trailers or railcars holding or receiving flammable liquids prior to opening covers or valves. Maintain the grounding continuity until the valves or covers are closed.
- When filling metal drums, use bonding straps between the drum and the conducting filling pipe.
- When filling plastic containers, either use a grounded lance and fill the container from the bottom, or pre-purge the container with an inert gas, such as nitrogen.
- Ground all metallic vent pipes, emergency relief pipes and vapor recovery pipes/equipment.
Conduct and document annual tests of all bonding/grounding systems to verify that a continuously electrically conductive path is maintained.

4.6 Tank Systems
Tanks holding flammable liquids must be designed, constructed, installed and maintained in accordance with applicable local regulations or the following recognized good engineering standards:

Underwriters Laboratories: 58, 80, 142, 2080, 2085, 1316
American Petroleum Institute: 12B, 12D, 12F, 650

Place tanks to minimize potential personnel injury that could result in an explosion incident.
- Place outdoor tanks at least 15 meters (50 feet), from normally populated buildings and protect them with manual fire hydrants or monitor nozzles and foam fire fighting capabilities; or
- If the 15 meters (50 feet) space separation cannot be achieved, then fixed deluge protection (water or foam) is required.

Provide tanks or process vessels receiving flammable liquids from bulk tanks with physical or administrative controls to prevent overfilling.

Adequately vent tanks to prevent the development of a vacuum or pressure that can distort or rupture the tank.
- Vents must be minimally sized to be at least as large as the largest filling or withdrawal connection.
- Every above-ground tank must have emergency relief venting, such as a floating roof, a weak roof-to-shell seam or pressure-relieving devices. The capacity of these devices must be sufficient to prevent the rupture of the shell or tank bottom, or heads (if a horizontal tank) under normal and emergency conditions.
- Venting for indoor tanks must be extended outdoors.
- Venting devices must be normally closed or be provided with flame arrestors. Vent outlets must be located away from ignition sources, air intakes, windows, building eaves or other obstructions that could cause a fire or explosion hazard.
- Properly size vent manifolds for multiple releases from any tanks subject to a common exposure fire, i.e., within the same room or dike.
4.7 Ventilation Systems
Provide areas in which vapors generated from the handling of flammable liquids are likely to create a fire hazard (such as dispensing, transferring, mixing and filling areas) with ventilation sufficient to keep the concentration below 25% of the Lower Explosive Limit (LEL).

- Natural ventilation is adequate for all outdoor storage and handling areas and in areas where flammable liquids are stored in sealed containers, sampled or are confined to closed (welded) piping systems. Note that Tri-clamp fittings do not constitute a closed piping system.
- Unless otherwise validated to meet the performance criteria above, mechanical ventilation systems must provide a minimum flow rate of 0.3 m$^3$/min/m$^2$ (1 cfm/ft$^2$) of floor area.
- Supplement recirculating ventilation systems with combustible gas detection that stops recirculation and converts to full exhaust ventilation when the vapor concentration reaches 25% of the LEL.

4.8 Containment and Drainage
Provide drainage and/or containment, sized for largest anticipated spill plus firewater, to prevent fire spread to adjacent areas and to prevent contaminated firewater runoff from reaching waterways.

- If water-only sprinkler systems are used, design on-site containment of firewater runoff for a 2-hour fire duration. If foam-water systems are used, then on-site containment can be reduced to the 30-minute foam duration.
- If legally compliant, drainage or containment may be provided through dedicated sumps, stormwater detention ponds, and open parking lots that have purposefully had the stormwater drains blocked. Public sewers with secondary treatment or on-site wastewater treatment units are also acceptable if:
  - The flammable liquids are water miscible and will not float on the firewater, potentially spreading the fire through the drain systems; and
  - The discharge will not violate any limits established by the public treatment works or local regulations.

4.9 Additional Fire Controls
Provide in-rack or other automatic fire extinguishing systems, fire stops and other infrastructure fire control elements as determined necessary for life safety purposes by local and Company requirements, and the site’s flammable liquid risk assessment.
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References

Fire Safety Guidelines ES-RF-140
Fire Protection Equipment Maintenance Guidelines ES-RF-141
ATEX 95 Equipment Directive 94/9/EC
ATEX 137 Workplace Directive 99/92/EC
DISCUS Standard—Distilled Spirits Counsel of the United States Standards
Factory Mutual Data Sheet 7-29 (July 1997)
NFPA 25 Water-based Fire Protection
NFPA 30 Flammable and Combustible Liquids Code
NFPA 70 National Electrical Code
NFPA 80 Fire Doors and Other Openings
NFPA 505 Fire Safety Standard for Powered Industrial Trucks
OSHA 1910.178 (Lift Trucks)
Electrical Safety Requirements ES-RQ-120
Fire Control Requirements ES-RQ-140
Hot Work Requirements ES-RQ-170
Managing Hazardous Materials Requirements ES-RQ-190

Revision History

<table>
<thead>
<tr>
<th>Revision Date</th>
<th>Summary of Change</th>
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<tbody>
<tr>
<td>17-Jun-2011</td>
<td>Added requirements for concentrate and beverage base plants.</td>
</tr>
<tr>
<td>1-Jan-2010</td>
<td>Revised document released as part of the TCCMS Redesign - Governance Reset. This document contains content from the previous version with reformatting and significant rewording.</td>
</tr>
<tr>
<td>3-July-2007</td>
<td>Defined some Requirements as applicable only to TCCC operations. Color-coded sections for clarity. For consistency with other Requirements, modified compliance statement, added Application text for Building requirements</td>
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<tr>
<td></td>
<td>Expanded consensus standards for flammable liquid cabinets</td>
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<tr>
<td>7-Nov-2006</td>
<td>Converted to current TCCQS format, revised to incorporate NFPA 30 2003 revisions, added section for tank storage, added summary tables, added definitions.</td>
</tr>
<tr>
<td>Aug. 2004</td>
<td>Converted to Standard &amp; Guidelines format</td>
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<tr>
<td>Aug. 1998</td>
<td>Initial Issue</td>
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Appendix

Definitions

#2 Diesel Fuel: A general term used for petroleum distillate fuels used in high-speed diesel engines, such as those in trucks and automobiles, or in atomizing type industrial heating units. Common names include #2 Fuel Oil, #2 Distillate, Light Fuel Oil (LFO), Bunker A.

Automatic Detection System: Any system that responds to a fire or evidence of fire by initiating an alarm, (audible, visible or electronic alert) to a local area, control panel, response service or automatic dialer. Typically, these systems use heat detectors, smoke detectors or fire system flow valves to initiate the alarm.

Automatic Fire Control System: Any system that responds to a fire or evidence of fire by initiating extinguishing or control activity. Typically, these systems use some detector or heat-activated fusible link to activate a sprinkler system (water or foam), pressurized extinguishing media, fire doors, ventilation system or other control.

Bonding Strap: A conductive cable connected to a container and a pipe or outlet to ensure that the pipe and/or container are, and remain at, the same electrical potential to prevent sparking during a filling operation.

Bulk Storage Area: Location where flammable liquid is stored in tanks and other large containers greater than 1100 liters (290 gallons).

Classified Electrical Equipment: Electric equipment and wiring approved for use in locations where flammable vapors, liquids or gases or combustible dusts or fibers may be present. Equipment specifications vary based on the type and concentration of the hazard and its proximity to an ignition source. Classified electrical equipment is sometimes referred to as “intrinsically safe” or “explosion proof/” For this Requirement, electrical classifications and specifications are defined by the National Electrical Code (NFPA 70C-74),

Combustible Materials: Including, but not limited to paper products (corrugated cartons, sheet liners, packaging, labels); plastics (PET bottles, preforms, resin, crates, closures, stretch/shrink wrap, drums); pallets; and combustible liquids [liquid having a flashpoint at or above 38°C (100°F)].

Fire Rating: A rating of the fire resistance as determined by a listing agency. All fire doors have a label permanently affixed to the door stating the rating and the listing agency.
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**Fire-Rated Partition:** A wall that provides a fire resistance rating of one (1) or two (2) hours. A fire-rated partition will not be freestanding, will not be parapeted and can have penetrations (operations doors, man doors, conveyor openings, HVAC penetrations, etc). To maintain the rating of the partition, the penetrations must be provided with closures of appropriate rating.

**Fire Stop:** Fire stopping/sealing compounds are products that are used to seal openings and maintain the integrity of a fire-rated wall/partition. These materials are produced in various shapes and sizes and are capable of closing various size wall (or floor) openings. The material should provide a fire resistance rating equivalent to the fire rating of the wall/partition. Only Underwriters Laboratories (UL) listed materials should be used.

**Flammable liquid:** Based on National Fire Protection Association (NFPA) 30 – Flammable and Combustible Liquid Code – 1999 Edition, flammable liquid has a flash point less than 38°C (100°F), and includes liquid sub-classifications 1A, 1B and 1C. The European Community definition of flammable liquid includes liquids with flash point less than 55°C (131°F), using 1A, 1B and 1C sub-classifications. United Nations Recommendations for the transport of Dangerous Goods, as well as modal codes for ocean freight, air freight and road/rail transport define a flammable liquid as one having a flash point less than 61°C (141°F).

Given the absence of a universally applicable upper-bound flash point limit for the definition of Flammable Liquid, this Requirement is intended to cover all liquids that bear the “Flammable” liquid label (often red with a black or white flame) and other flammable liquids, which, though unlabeled, are known to a facility and have a flash point below 61°C (141°F). 

#2 Diesel Fuel is specifically excluded from scope, unless required by local regulation.

**Flammable Liquid Cabinet:** A cabinet specifically designed for safe storage of flammable liquids that:

- Meets or exceeds appropriate local country requirements or equivalent consensus standards, such as NFPA or EN, and is certified by Underwriters Laboratories, CSA, FM Global or other equivalent local agencies; or
- Is fire resistant (designed and constructed to limit the internal temperature to not more than 163°C (325°F) when subjected to a 10-minute fire test); or
- Is constructed of metal at least as thick as No. 18 gage sheet iron, and double walled with ~ 4 centimeters (1 1/2-inch) air space; or
- Is constructed of plywood at least 1 inch in thickness, which must not break down or delaminate under fire conditions.

**Flammable Liquid Handling Area:** An area where flammable liquid(s), as ingredients, intermediate products or finished goods, are transferred from one container to another or are processed.
Grounded Lance: A device used when filling containers with flammable liquid. The device can be inserted into the container and will allow the container to be filled from the bottom. The lance is grounded, is in contact with the liquid and will not allow a static charge to accumulate.

Grounding/Bonding Strap: A conductive cable used to ground a piece of equipment to insure that it is at zero electrical potential.

Hot Work: Any cutting, welding, soldering, sweating or other activity involving a torch, open flame or other ignition source. Grinding, torch-applied roofing and portable heating units, such as gas-fired salamanders, electric heaters, hot-air guns and similar devices, also require a hot work permit.

Impairment: A condition where a piece of protective equipment, such as a sprinkler system, alarm system, ventilation system or other protective device or system, is taken out-of-service.

Unprotected: Flammable liquid storage and/or use areas that are not provided the fire controls prescribed by these Requirements are considered “unprotected.”